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United States Environmental Protection Agency

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EPA CHEMICAL ACCIDENT PREVENTION AND THE CLEAN AIR ACT AMENDMENTS OF 1990

Quick Reference Fact Sheet

New Requirements to Prevent Chemical Accidents

Preventing accidental releases of hazardous chemicals is the shared responsibility of industry, government, and the public. The first steps toward prevention are identifying and assessing the hazards. Once this information is openly shared, industry, government, and the community can work together toward reducing chemical risks to public health and the environment.

The Clean Air Act (CAA) Amendments, whch were signed into law on November 15, 1990, contain important provisions that advance the process of risk management planning and public disclosure of risk. The amendments, which cover a wide range of air pollution issues, include specific provisions addressing accidental releases that will affect facilities that produce, handle, process, or store certain chemicals.

The Clean Air Act makes it clear that facilities that handle hazardous substances bear the primary responsibility for ensuring their safe use. The CAA section 112(r) general duty clause outlines the underlying principle of the statutory provisions. Facilities are responsible for designing and maintaining a safe plant, identifying their hazards, and minimizing the consequences of accidental chemical releases. The general duty clause applies to any facility that handles a substance that may be hazardous, regardless of the quantity on site and regardless of whether it is on a government list.

The provisions also require EPA to establish a list of regulated substances and thresholds and to promulgate accident prevention regulations, including requirements for risk management plans. Industry is required to develop these plans, to comply with accident prevention regulations, to share plans with the public, and to operate in a safe manner. Other provisions include establishment of an independent accident investigation board, a study on hydrofluoric acid, and a mandate for OSHA to establish a chemical process safety management standard for the workplace.

More specifically, under the amended Clean Air Act, EPA must:

* Publish a list of at least 100 substances and associated threshold quantities that determine who must comply with the new regulations

* Develop regulations and guidance for the response, prevention, and detection of accidental releases associated with these regulated substances

Certain facilities must:

* Prepare risk management plans that include a hazard assessment, accident prevention program, and emergency response program

* Comply with other accidental release regulations that EPA may adopt.

The CAA also requires that each state establish programs to provide small businesses with technical assistance on the CAA and help them comply with the Act's regulations. By statute these small business programs must include assistance related to accidental release prevention and detection. These programs will provide information on alternative technologies, process changes, products, and methods of operation that help reduce air pollution.

Background: Chemical Accident Prevention Before 1990

Public awareness of the potential danger from accidental releases of hazardous substances has increased over the years as serious chemical accidents have occurred ar[illegible]d the world. Public concern intensified fo[illegible]owing the 1984 release of methyl isocyanate in Bhopal, India, which killed more than 2,000 people. A subsequent chemical release in Institute, West Virginia, sent more than 100 people to the hospital and made Americans aware that such incidents can and do happen in the United States.

EPA's Response to Bhopal

In response to this public concern and the hazards that exist, EPA began its Chemical Emergency Preparedness Program (CEPP) in 1985. CEPP was a voluntary program to encourage state and local authorities to identify hazards in their areas and to plan for potential chemical emergencies. This local planning complemented emergency response planning carried out at the national and regional levels by the National Response Team and Regional Response Teams.

The following year, Congress enacted many of the elements of CEPP in the Emergency Planning and Community Right-to-Know Act of 1986, also known as Title III of the Superfund Amendments and Reauthorization Act of 1986 (SARA). SARA Title III requires states to establish state and local emergency planning groups to develop emergency response plans for each community. SARA Title III also requires facilities to make information available to the public on the hazardous chemicals they have on site. Workers on site also have a right to know about the chemicals to which they could be exposed. The U.S. Occupational Safety and Health Administration (OSHA) has requirements to make information on hazardous chemicals in the workplace available to employees.

Milestone Report on Systems for Prevention

SARA Title III did not require facilities to establish accident prevention programs. Title III's reporting requirements, however, foster a valuable dialogue between industry and local communities on hazards to help citizens become more informed about the presence of hazardous chemicals that might affect public health and the environment. In addition, under SARA section 305(b), EPA was required to conduct a review of emergency systems to monitor, detect, and prevent chemical accidents at facilities across the country. The final report to Congress, *Review of Emergency Systems* (EPA, 1988), concluded that the prevention of accidental releases requires an integrated approach that considers technologies, operations, and management practices, and it emphasized the importance of management commitment to safety.

EPA's Prevention Program Takes Shape

Although SARA Title III did not directly address accident prevention except through section 305(b), EPA recognized that prevention, preparedness, and response form a safety continuum. Therefore, in 1986, EPA established its Chemical Accident Prevention Program and began collecting information on chemical accidents. At the same time, EPA began working with other stakeholder groups to increase knowledge of prevention practices and encourage industry to improve safety at facilities.

Under the Chemical Accident Prevention Program, EPA developed the Accidental Release Information Program (ARIP) to collect data on the causes of accidents and the steps facilities take to prevent recurrences. EPA also developed its Chemical Safety Audit Program to gather and disseminate information on successful practices to mitigate and prevent chemical accidents. The audit program also points out problematic practices and ways to

improve them. Through the program, EPA has trained its regional staff as well as state officials on process safety and auditing techniques. Another significant component of EPA's Chemical Accident Prevention Program involves outreach to small and medium-sized enterprises, which the section 305(b) study indicated are generally less aware of risks than larger facilities. EPA has worked with a broad spectrum of stakeholder groups to determine the best ways to reach these smaller operations.

All these efforts are based on the premise that while industry bears the primary responsibility for preventing and mitigating chemical accidents, many other groups also have a role to play. Workers, trade associations, environmental groups, professional organizations, public interest groups, the insurance and financial community, researchers and academia, the medical profession, and governments at all levels can help facilities that use hazardous chemicals to identify their hazards and find safer ways to operate. A number of stakeholder groups have developed programs and guidance to assist facilities in the management of chemical hazards. Many of these safety measures can make businesses more efficient and productive.

Clean Air Act Requirements: What Chemicals are Covered?

The CAA mandates that EPA develop and publish an initial list of at least 100 substances that, in an accidental release, could cause death, injury, or serious adverse effect to human health or the environment. The CAA mandates the inclusion of 16 substances (see the box in the next column).

In selecting other substances for the list, EPA considered the severity of any acute adverse health effects, the likelihood of an accidental release, and the potential magnitude of human exposure. In determining threshold quantities for each chemical, EPA considered toxicity, reactivity, volatility, flammability, explosivity, and dispersibility as well as the amount known or anticipated to cause effects of concern. EPA selected commercially produced, acutely toxic and volatile substances for this list from the SARA Title III section 302 list of extremely hazardous substances. EPA chose volatile substances because they are more likely to become airborne and impact the public. One substance, oleum, was listed because it has a history of accidents that have affected the public. Since flammable vapor cloud explosions and blast waves from detonations of high explosives have caused injuries to the public and damage to the environment, EPA also includes highly flammable gases and liquids as well as high explosives on the list.

List of Substances Required by Statute

The Clean Air Act specifies the following 16 hazardous substances for inclusion in the inital list of regulated substances:

Chlorine
Anhydrous ammonia
Methyl chloride
Ethylene oxide
Vinyl chloride
Methyl isocyanate
Hydrogen cyanide
Ammonia (in addition to anhydrous ammonia)
Hydrogen sulfide
Toluene diisocyanate (isomer not specified)
Phosgene
Bromine
Anhydrous hydrogen chloride
Hydrogen fluoride
Anhydrous sulfur dioxide
Sulfur trioxide

On January 14, 1994, EPA's Administrator signed the final rule on the substances and thresholds. The list includes 77 acutely toxic chemicals, 63 flammable gases and volatile flammable liquids, and Division 1.1 high explosive substances as listed in 49 CFR 172.101. The rule establishes threshold quantities for toxic substances that range from 500 to 20,000 pounds. For all listed flammable substances, the threshold quantity is established at 10,000 pounds. For explosive substances, the threshold quantity is set at 5,000 pounds. Note that the threshold quantity is determined by the maximum amount in a process, not the maximum quantity on site.

The rule also sets forth the procedures for determining whether a threshold quantity of a regulated substance is present at a stationary

source. In addition, the rule specifies the requirements for petitions to the Agency to add substances to, or delete substances from, the list.

Risk Management Planning

For industry, chemical accident prevention has become more than a regulatory requirement. More and more plant managers, whether they are subject to regulation or not, recognize chemical safety management as an integral part of running an efficient operation. At the same time, new regulations have ensured that the public can be properly informed about chemical risks in their neighborhoods, and community organizations, states, and the federal government all have become active players in helping to lower these risks.

EPA published its proposed regulation on the risk management program on October 20, 1993. The program will apply to facilities that have more than a threshold quantity of a regulated substance in a process. As mandated by the CAA, the proposed rule requires facilities to develop and implement a risk management program that includes a hazard assessment (offsite consequence analyses, including worst-case scenarios, a 5-year accident history), a prevention program, and an emergency response program.

The elements of EPA's proposed prevention program adopt and build upon OSHA's process safety management standard, issued on February 24, 1992 (see page 5). Currently, four states--New Jersey, California, Nevada, and Delaware-- also have regulations on accidental release prevention. In addition, the Chemical Manufacturers Association through Responsible Care ™, the American Institute of Chemical Engineers, the American Petroleum Institute, and the European Community all have programs relating to chemical process safety management. EPA has met with industry, environmentalists, professional groups, and representatives of states and localities to solicit input in shaping the federal regulations.

The risk management plans required by the by the CAA are to be registered with EPA and submitted to the Chemical Safety and Hazard Investigation Board, the implementing agency (the state or EPA), the State Emergency Response Commissions, and Local Emergency Planning Committees (LEPCs). The plans will also be made available to the public.

The information in these risk management plans complements information on chemicals already provided by facilities to states and LEPCs under SARA Title III. Once the CAA regulations are in effect, it will be unlawful for facilities that have at least a threshold quantity of a listed substance to operate in violation of the accident prevention regulations.

The regulations on risk management will take effect three years after the date of their final publication. Should EPA add to the list of regulated substances, the regulations would take effect for newly covered sources three years after the date on which a substance is first listed.

Prevention Program Requirements

The proposed elements of the prevention program include the following:

- Review and documentation of the plant's chemicals, processes, and equipment
- Detailed process hazard analyses to identify hazards, assess the likelihood of accidental releases, and evaluate the consequences of such releases
- Development of standard operating procedures
- Training of employees on procedures
- Implementation of a preventive maintenance program
- Management of changes in operation that may impact the safety of the system
- Reviews before initial start-up of a process and before start-up following a modification of a process
- Investigation and documentation of accidents
- Periodic safety audits to ensure that procedures and practices are being followed

EPA estimates that approximately 118,000 facilities could be affected by the risk management planning requirements. These facilities include manufacturers, oil and gas production facilities, cold storgae facilities with ammonia refrigeration systems including food processors and distributors and refrigerated warehouses, public water treatment systems, wholesalers and distributors of these chemicals, utilities, propane retailers, certain small businesses, and some service industries, such as janitorial services and commercial laundries.

Other CAA Provisions

Chemical Safety and Hazard Investigation Board

The CAA establishes a five-member, Presidentially appointed board to investigate (or cause to be investigated) chemical releases that result in death, serious injury, or substantial property damage. The purpose of the board is to determine the cause or probable causes of accidents and to report on them to the public. The board may also conduct research and studies related to chemical accident prevention and may make recommendations to federal, state, and local authorities on ways to reduce the likelihood or consequences of accidental releases. Jurisdiction over transportation accidents (air, rail, highway, barge) involving hazardous chemicals, however, remains with the National Transportation Safety Board.

Hydrofluoric Acid Study

As required by the CAA, EPA has conducted a study on the potential hazards of hydrofluoric acid and its uses with respect to chemical accidents. The study, transmitted to Congress in the fall of 1993, investigates the physical and chemical properties of HF and its hazards in commercial and industrial use. A characterization of the HF industry identifies the types of facilities in which HF is handled and the approximate number of these facilities nationwide. The document describes accidents that have resulted in the release of HF, as well as any public and environmental impacts that resulted from these releases. An analysis of scenarios using atmospheric dispersion models investigates potential impacts on the public from a range of worst-case accidental releases. The study also describes the current industry and government controls to prevent accidental releases of HF and to mitigate the potential consequences of accidents through emergency preparedness and response efforts.

Presidential Review

The CAA requires the President to conduct a review of the current authority of various federal agencies regarding chemical release prevention, mitigation, and response and to report the findings to Congress. The purpose of the review is to clarify and co-ordinate responsibilities and to identify any gaps and/or overlaps that may exist.The President delegated this authority to the EPA Administrator in 1993.

Research Programs

The CAA requires EPA to establish a program of long-term research on methods and techniques for conducting detailed hazard assessments. The CAA also requires EPA to test substances at the Liquefied Gaseous Fuels Spill Test Facility in Nevada to develop and validate improved predictive models for atmospheric dispersion, evaluate existing dispersion models, and evaluate technology for mitigation and emergency response.

New OSHA Standard

On February 24, 1992, OSHA adopted, as required under the CAA 1990 amendments, a standard requiring chemical process safety management in the workplace--designed to protect employees of facilities that use highly hazardous chemicals.

The list of highly hazardous chemicals that is part of the OSHA standard includes acutely toxic, highly flammable, and reactive substances. Requirements of the standard cover safety information on chemicals and processes, a workplace process hazard analysis, periodic audits, standard operating procedures, training, maintenance, pre-start-up safety reviews, management of change, emergency response, and accident investigation.

To minimize the confusion for facilities covered by both the EPA and OSHA rules, the elements and language of EPA's proposed prevention program are nearly identical to the parallel elements in OSHA's process safety management standard. The differences between the two

programs reflect the distinctions of the statutory language of the CAA. EPA's mandate is to protect public health and the environment; while the OSHA standard is intended to protect workers from chemical accidents involving highly toxic, reactive, flammable, or explosive substances. EPA anticipates that facilities in compliance with the requirements in the OSHA rule will also be in compliance with EPA's proposed prevention program elements.

Natural Evolution

Since the mid-1980s, EPA has been working closely with industry to help reduce the likelihood and severity of chemical accidents. Beginning with the voluntary Chemical Emergency Preparedness Program in 1985, extending to the SARA Title III regulations in 1986, and now culminating in the new Clean Air Act, these efforts address the entire safety continuum from emergency response to preparedness to prevention. At the same time, a new partnership involving government, business, and the public is being forged. Working together, each of these groups will play a key role in preventing accidental releases of hazardous chemicals.

For more information on EPA's proposed rules on chemical accident prevention under the CAA, contact:

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U.S. Environmental Protection Agency
(5101)
401 M Street, SW
Washington, DC 20460

Emergency Planning and Community Right-to-Know Information Hotline
(800) 535-0202
Monday through Friday, 8:00 am--7:30 pm
(Eastern time)

Clean Air Act Amendments of 1990
Accidental Release Provisions
Chronology

1990	Clean Air Act Amendments signed into law, November 15
1991	EPA published guidance for the Clean Air Act section 112(r)(9) order authority
1993	EPA proposed a list of "regulated substances," thresholds, and petition procedures
	EPA proposed a regulation on risk management program and plans
	EPA provided hydrogen fluoride study recommendations to Congress
	EPA submitted review of federal authorities on chemical release prevention, mitigation, and response
1994	EPA published final regulation on list of substances
1995	EPA to publish final regulations on risk management programs and plans and related guidance documents
	States should submit and gain approval for state implementation of accident prevention program
1998	EPA regulations on risk management programs effective*

* or three years after publication of final regulations